

New data on the benthic Opisthobranch Molluscs from the Archipelago of Fernando de Noronha (Brazil), with description of a new species of *Aegires* Lovén, 1844

Nuevos datos sobre los moluscos opisthobranquios bentónicos del Archipiélago de Fernando de Noronha, con descripción de una nueva especie de *Aegires* Lovén, 1844

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ABSTRACT

New data on the opisthobranch fauna from the Archipelago Fernando de Noronha are presented in this paper, 111 specimens distributed among 12 species were studied and 11 of them are a new record for the archipelago. A new species of genus *Aegires* is described. The external anatomy and radula of this specimen are compared with other species of the genus.

RESUMEN

En este trabajo se presentan nuevos datos sobre la fauna de moluscos opisthobranquios del Archipiélago Fernando de Noronha, se estudian un total de 111 ejemplares repartidas en 12 especies, siendo que 11 de ellas son nuevas citas para el archipiélago. Se describe una nueva especie de Nudibranchia perteneciente al género *Aegires* Lovén, 1844. Se compara la anatomía externa y rádula de este espécimen con otras especies del género.

KEY WORDS: Mollusca, Opisthobranchia, Fernando de Noronha, *Aegires*, new species.

PALABRAS CLAVE: Mollusca, Opisthobranchia, Fernando de Noronha, *Aegires*, nueva especie.

INTRODUCTION

The Archipelago Fernando de Noronha (Brazil) lies off Cape São Roque, State of Rio Grande do Norte, about 195 nautical miles offshore (03° 51' S, 32° 25' W). Besides the island of Fernando de Noronha, several smaller islands, all of volcanic origin, compose the Archipelago of the same name. The archipelago lies in

the north branch of the South equatorial oceanic current, with high temperature, salinity and transparency. The intertidal bottoms are mostly of hard substrate with a few sandy beaches, having a dominant community of seaweeds (calcareous algae, *Sargassum* sp. and filamentous green algae) and Vermetidae.

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Table I. Opisthobranchs from Fernando de Noronha Archipelago recorded by MATTHEWS AND KEMPF (1970); RIOS AND BARCELLOS (1979) and present paper. 000: abundant (20 or more specimens); 00: moderate ($20 > n > 2$); 0: rare ($n \leq 2$).

Tabla I. Opisthobranchios del Archipiélago de Fernando de Noronha citados por MATTHEWS AND KEMPF (1970); RIOS AND BARCELLOS (1979) y en el presente trabajo. 000: abundante (20 o más ejemplares); 00: moderado ($20 > n > 2$); 0: raro ($n \leq 2$).

Species	Matthews and Kempf (1970)	Rios and Barcellos (1979)	Present paper
Cephalaspidea			
<i>Micromelo undata</i>	X		00
<i>Hydatina vesicaria</i>	X		
<i>Atys</i> sp.	X		
<i>Atys mandrewii</i>		X	
<i>Retusa canaliculata</i>	X		
<i>Cylichna noronhensis</i>	X		
Anaspidea			
<i>Aplysia</i> sp.	X		
<i>Stylocheilus longicauda</i>			000
Ascoglossa			
<i>Caliphylla mediterranea</i>			00
<i>Elysia ornata</i>			000
<i>Elysia flava</i>			0
Notaspidea			
<i>Pleurobranchus areolatus</i>			0
<i>Berthelinia caribbea</i>		X	
<i>Berthella stellata</i>			0
Doridacea			
<i>Doris</i> sp.	X		
<i>Aegires absaloi</i>			0
<i>Chromodoris neona</i>			00
<i>Platydorid angustipes</i>			0
<i>Dendrodoris senegalensis</i>			00
Aeolidacea			
<i>Phidiana</i> sp.			00

MATTHEWS AND KEMPF (1970) provided a checklist of the molluscan fauna from the Archipelago of Fernando de Noronha and Atol das Rocas. Although more than 160 species of Molluscs were listed, however only seven species of opisthobranch gastropods were cited. Besides four species were referred by LOPES AND ALVARENGA (1957) this material was not found by these authors, and finally two species was referred by RIOS AND BARCELLOS (1979) (Table I).

In this paper new species of opisthobranchs found in the Archipelago of Fernando de Noronha are cited, based on material obtained by the authors during two visits in 1999 and 2000.

MATERIAL AND METHODS

The species studied in this paper were collected by diving down to 20 m along the littoral, during two trips to

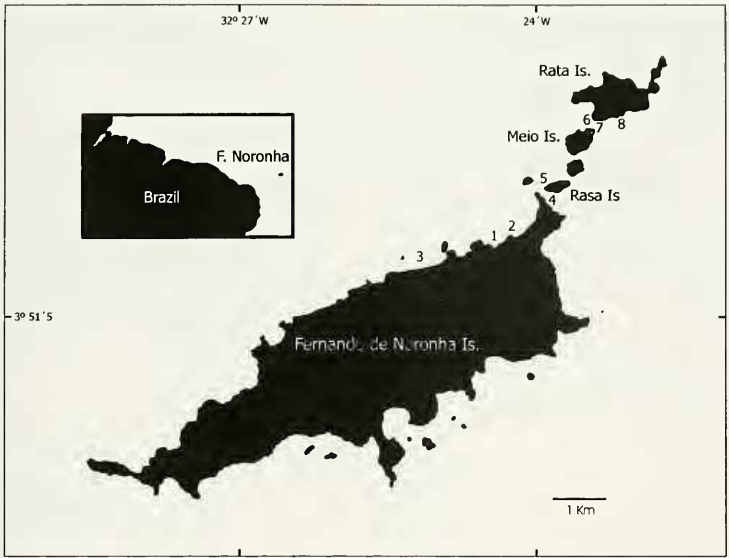


Figure 1. Sampling localities. 1 Praia do Cachorro, 2 Porto, 3 Praia da Conceição, 4 Air France Is. Rasa, 5 Rasa Is., 6 Buraco do Inferno Rata Is., 7 Lage Dois Irmãos between Rata and Meio Is., 8 Ressurreta Rata Is.

Figura 1. Localidades de muestreo. 1 Praia do Cachorro, 2 Porto, 3 Praia da Conceição, 4 Air France Is. Rasa, 5 Rasa Is., 6 Buraco do Inferno Rata Is., 7 Lage Dois Irmãos entre Rata y Meio Is., 8 Ressurreta Rata Is.

Archipelago de Fernando de Noronha in 1999 and 2000. The sampling stations are represented in Figure 1. For each species the dates and depth of collection, stations, and lengths of the specimens alive are recorded. Besides this, the distributions in Brazil and in other geographical areas are included.

The specimens collected have been deposited in the collections of the

Department of Physiology and Zoology of the University of Seville and Department of Ecology and Animal Biology of the University of Vigo (Spain) and the holotype of *Aegires* was deposited in the Museu Oceanográfico "Prof. Eliézer de Carvalho Rios" from the Foundation University of Rio Grande, in Rio Grande, Brazil, with code number 42.011.

RESULTS

Class GASTROPODA Cuvier, 1797
 Subclass OPISTHOBRANCHIA Milne-Edwards, 1848
 Order CEPHALASPIDEA Fischer, P. 1883
 Family Hydatinidae Pilsbry, 1895
 Genus *Micromelo* Pilsbry, 1895

Micromelo undata (Bruguière, 1792) (Fig. 2A)

Material collected: 06/07/1999; station: Praia do Cachorro (Fernando de Noronha Is.); depth: intertidal; 1 specimen; length: 17 mm. 08/07/1999; station: Praia do Cachorro (Fernando de Noronha

Is.); depth: intertidal; 1 specimen; length: 30 mm. 07/07/1999; station: Porto (Fernando de Noronha Is.); depth: 1 m; 5 specimens; length in mm: 15.5 to 22 mm. 15/06/2000; station: Porto (Fernando de Noronha Is.); depth: 1 m; 1 specimen; length: 15 mm. 19/06/2000; station: Porto (Fernando de Noronha Is.); depth: 1 m; 1 specimen; length: 17 mm.

Habitat: On rocks with algae and in tidal pools with *Cystoseira*.

Brazilian distribution: NE Brazil, from Pernambuco to Bahia (MARCUS AND MARCUS, 1967; RIOS, 1994). Fernando de Noronha Is. (MARCUS AND MARCUS, 1967; MATTHEWS AND KEMPF, 1970; RIOS, 1994).

Other geographical areas distribution: Circumtropical species, Caribbean Sea, Atlantic Ocean, Macaronesia, Ascension Is, Southern Africa and Indo-Pacific Ocean (GOSLINER, 1987; MALAQUIAS, 2001; MARCUS AND MARCUS, 1967; MARCUS, 1977; MIK-KELSEN, 1995; ORTEA, MORO, BACALLADO AND HERRERA, 2000; RIOS, 1994).

Order ANASPIDEA Fischer P., 1883
Family DOLABRIFERIDAE Pilsbry, 1895
Genus *Stylocheilus* Gould, 1852

Stylocheilus longicauda (Quoy and Gaimard, 1824) (Fig. 2B)

Material collected: 07/07/1999; station: Porto (Fernando de Noronha Is.); depth: intertidal; 1 specimen; length: 22 mm. 08/07/1999; station: Praia da Conceição (Fernando de Noronha Is.); depth: intertidal; 7 specimens; length: 15 to 33 mm. 10/07/1999; station: Air France (Rasa Is.); depth: intertidal; 3 specimens; length: 18 to 20 mm. 16/06/2000; station: Rasa Is.; depth: intertidal; 17 specimens; length: 12 to 36 mm. 17/06/2000; station: Buraco do Inferno (Rata Is.); depth: 12 m; 4 specimens; length: 19 to 29 mm. 19/06/2000; station: Buraco do Inferno (Rata Is.); depth: 14 m; 6 specimens; length: 6 to 28.

Habitat: On and under rocks, associated with masses of red algae.

Brazilian distribution: Pernambuco, Recife (MARCUS AND MARCUS, 1970).

Other geographical areas distribution: Circumtropical (FARMER, 1967; MARCUS, 1977; MARSHALL AND WILLAN, 1999; RIOS, 1994).

Order SACOGLOSSA Von Ihering, 1876
Family HERMAEIDAE Adams H. and A.
Genus *Caliphylla* Costa, A. 1869

Caliphylla mediterranea A. Costa, 1867 (Figs. 2C, D)

Material collected: 15/06/2000; station: Porto (Fernando de Noronha Is.); depth: 5 m; 1 specimen; length: 16 mm. 19/06/2000; station: Porto (Fernando de Noronha Is.); depth: 5 m; 10 specimens; length: 8 to 19 mm.

Habitat: Associated with filamentous green algae.

Brazilian distribution: South Brazil in São Paulo State (Santos, São Sebastião Is., Cananeia) (MARCUS, 1977; RIOS, 1994).

Other geographical areas distribution: Mediterranean Sea; Atlantic Ocean from

Spain to Senegal, Canary Is. and Caribbean Sea (CERVERA, TEMPLADO, GARCÍA-GÓMEZ, BALLESTEROS, ORTEA, GARCÍA, ROS AND LUQUE, 1988; GASCOIGNE, 1979; JENSEN AND CLARK, 1983; MARCUS AND MARCUS, 1970; MARCUS, 1977; ORTEA ET AL., 2000; PRUVOT-FOL, 1954; SCHMEKEL AND PORTMANN, 1982).



Figure 2. A: *Micromelo undata*; B: *Stylocheilus longicauda*; C, D: *Caliphylla mediterranea*; E, F: *Elysia ornata*; G: *Elysia flava*; H: *Pleurobranchus areolatus*; I: *Aegires absalaoi* n. sp.; J: *Chromodoris neona*; K: *Platydorid angustipes*; L: *Dendrodoris senegalensis*; M: *Phidiana* sp.

Figura 2. A: *Micromelo undata*; B: *Stylocheilus longicauda*; C, D: *Caliphylla mediterranea*; E, F: *Elysia ornata*; G: *Elysia flava*; H: *Pleurobranchus areolatus*; I: *Aegires absalaoi* n. sp.; J: *Chromodoris neona*; K: *Platydorid angustipes*; L: *Dendrodoris senegalensis*; M: *Phidiana* sp.

Family ELYSIIDAE Forbes and Hanley, 1851

Genus *Elysia* Risso, 1818

Elysia ornata (Swainson, 1840) (Figs. 2E, F)

Material collected: 08/07/1999; station: Lage dois Irmãos, between Meio Is. and Rata Is. (Fernando de Noronha Is.); depth: 18 m; 1 specimen; length: 22 mm. 15/06/2000; station: Porto (Fernando de Noronha Is.); depth: 5 m; 22 specimens; length: 22 to 36 mm. 17/06/2000; station: Buraco do Inferno (Rata Is.); depth: 12 m; 1 specimen; length: 12.5 mm. 19/06/2000; station: Porto (Fernando de Noronha Is.); depth: 5 m; 12 specimens; length: 15 to 36 mm.

Habitat: Associated with filamentous green algae.

Brazilian distribution: Present paper, first record to Brazilian coast.

Other geographical areas distribution: Circumtropical, Atlantic Ocean from Carib-

bean Sea to Canary Is. and Azores Archipelago; Indo-Pacific Ocean in Hawaii, Vietnam and Australia (MALAQUIAS, 2001; MARCUS and MARCUS, 1970; MARCUS, 1980; MARSHALL AND WILLAN, 1999; ORTEA ET AL., 2000; THOMPSON, 1977).

Elysia flava Verrill, 1901 (Fig. 2G)

Material collected: 08/07/1999; station: Praia da Conceição (Fernando de Noronha Is.); depth: intertidal; 1 specimen; length: 6 mm.

Habitat: Associated with filamentous green algae.

Brazilian distribution: Present paper, first record to Brazilian coast.

Other geographical areas distribution: From Mediterranean Sea, Canary Is. and

Madeira Archipelago to Caribbean Sea (CLARK, 1984; MALAQUIAS, CERVERA, ABREU AND LÓPEZ-GONZÁLEZ, 2001; MARCUS, 1980; ORTEA, 1981; ORTEA ET AL., 2000; THOMPSON, 1977, 1983; THOMPSON AND JAKLIN, 1988)

Order NOTASPIDEA Fischer P. 1883

Family PLEUROBRANCHIDAE Férussac, 1822

Genus *Pleurobranchus* Cuvier, 1804

Pleurobranchus areolatus Mörch, 1863 (Fig. 2H)

Material collected: 19/06/2000; station: Buraco do Inferno (Rata Is.); depth: 14 m; 1 specimen; length: 15 mm.

Habitat: Under rocks with ascidians, sponges, and other invertebrates.

Brazilian distribution: Cabo Frio (Rio de Janeiro State) (MARCUS, 1977; RIOS, 1994).

Other geographical areas distribution: East Pacific in Gulf of California,

Panama and Galapagos Islands. Atlantic Ocean from Florida to Canary Islands and Ghana (BERTSCH AND SMITH, 1973; EDMUNDS 1968; MARCUS AND MARCUS, 1967; ORTEA ET AL., 2000; RIOS, 1994).

Genus *Berthella* de Blainville, 1824

Berthella stellata (Risso, 1826)

Material collected: 10/07/1999; station: Air France (Rasa Is.); depth: intertidal; 1 specimen; length: 7 mm.

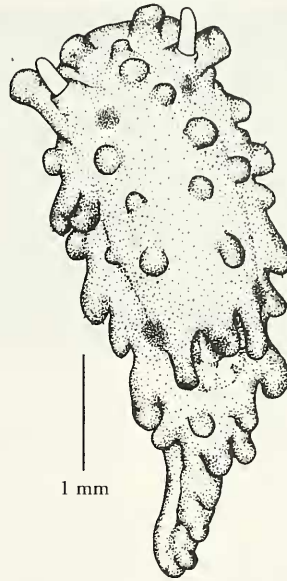


Figure 3. *Aegires absaloi* n. sp., external morphology.
Figura 3. *Aegires absaloi* n. sp., morfología externa.

Habitat: On rocks with ascidians, sponges and bryozoans.

Brazilian distribution: Cabo Frio (Rio de Janeiro State), Ubatuba, Ilhabela (São Paulo State) (RIOS, 1994, cited as *B. tupala*; MARCUS, 1957).

Other geographical areas distribution: *B. stellata* is a circumtropical

species, found from the Mediterranean Sea and the Canary Islands to the Atlantic coast of Panama. On the Pacific coast, Gulf of California, Bahia Tortugas, Baja California (CERVERA ET AL., 1988; GOSLINER AND BERTSCH, 1988; ORTEA ET AL., 2000; PRUVOT-FOL, 1954).

Order NUDIBRANCHIA de Blainville, 1814
Suborder DORIDINA Odhner, 1934
Family AEGIRETIDAE Fischer P., 1883
Genus *Aegires* Lovén, 1844
Aegires absaloi n. sp. (Fig. 2I, 3, 4)

Material collected: 19/06/2000; station: Buraco do Inferno (Rata Is.); depth: 14 m; 1 specimen; length: 5 mm. The holotype was deposited in the Museu Oceanográfico "Prof. Eliézer de Carvalho Rios" from the Foundation University of Rio Grande, in Rio Grande, Brazil, with code number 42.011

Etymology: The species has been named *Aegires absaloi* in honour of Dr. Ricardo Silva Absalão, Brazilian malacologist and friend.

Habitat: Under stones with sponges, and calcareous detritus.

Description: The unique specimen has a firm limaciform body, with abun-

dant spicules in the tegument. Dorsum with blunt tubercles, arranged in two marginal and one medial longitudinal rows in front of the gills, and one row

on the tail. There are two tubercles in front the rhinophores and other two mid-lateral tubercles between the marginal and central rows. There are three gills protected by three large anterior tubercles. The rhinophores are smooth and the rhinophoral sheaths have only a prominent lobe on the external side (Figure 3).

The colour pattern alive is creamy white with some brown spots on the dorsum. At the apex of some tubercles there is a minute brown spot (Figure 2l).

The labial armature lacks differentiated elements (Figure 4A). The radula has a formula of 15 x 10-0-10. The teeth are hook-shaped being the inner teeth slightly smaller than the outer (Figure 4B).

Discussion: Five species of the genus *Aegires* are known in Atlantic Ocean, *A. punctilucens* (Orbigny, 1837), *A. sublaevis* Odhner, 1932, *A. ortizi* Templado, Luque and Ortea, 1987, *A. gomezi* Ortea, Luque and Templado 1990 and *A. palensis* Ortea, Luque and Templado 1990. Externally, our specimen differs from these species by the presence of the rhinophoral sheath with five lobes and iridescent blue spots scattered over the back of *A. punctilucens*; the body of lemon-yellow colour, and presence of two longitudinal crest on the dorsum that join at the level of the rhinophores of *A. subla-*

avis (TEMPLADO, LUQUE AND ORTEA, 1987); the presence of rhinophoral sheaths having three large tubercles on the side distal to the rhinophores and a dark brown spot on the top of each tubercle of *A. ortizi* (TEMPLADO ET AL., 1987), the presence of prominent oblique ridges of *A. gomezi* (ORTEA, LUQUE AND TEMPLADO, 1990), and the color pattern, the presence of four series of two tubercles each joined by heavy ridges and rhinophoral sheath with six lobes of *A. palensis* (ORTEA ET AL., 1990).

Internally, our specimen differs of the rest of species by the presence of radular teeth with a denticle in their inner middle part in the radula of *A. ortizi* (TEMPLADO ET AL., 1987); labial armature with rods in *A. punctilucens* and *A. gomezi* (ORTEA ET AL., 1990).

Finally, our species is externally quite similar to *A. albopunctatus* MacFarland 1905, from the Pacific Ocean, by the colour pattern, white with irregularly scattered small dark-brown spots and external anatomy, having the dorsum with short blunt tubercles, cylindrical or with slightly expanded apices and tubercles, and tegument with numerous spicules. However, both species differ by the presence of rhinophoral sheaths with five or six high, rounded tubercles in the Pacific species (MACFARLAND, 1966) and only one in *A. absalaoi*.

Family CHROMODORIDIDAE Bergh, 1891
Genus *Chromodoris* Alder and Hancock, 1855
Chromodoris neona (Marcus, 1955) (Fig. 2j)

Material collected: 07/07/1999; station: Buraco do Inferno (Rata Is.); depth: 10 m; 2 specimens; length: 19, 21 mm. 09/07/1999; station: Buraco do Inferno (Rata Is.); depth: 7 m; 1 specimen; length: 23 mm.

Habitat: On big rocks with sponges, ascidians, hydrozoans, bryozoans and other invertebrates.

Brazilian distribution: São Paulo (MARCUS, 1955); Cabo Frio (MARCUS AND MARCUS, 1967); Cabo Frio (Rio de

Janeiro State), Ubatuba, São Sebastião (São Paulo State) (RIOS, 1994).

Other geographical areas distribution: Caribbean Sea in Florida, east of Panama, Colombia (MARCUS AND MARCUS, 1967; MARCUS, 1977; RIOS, 1994).

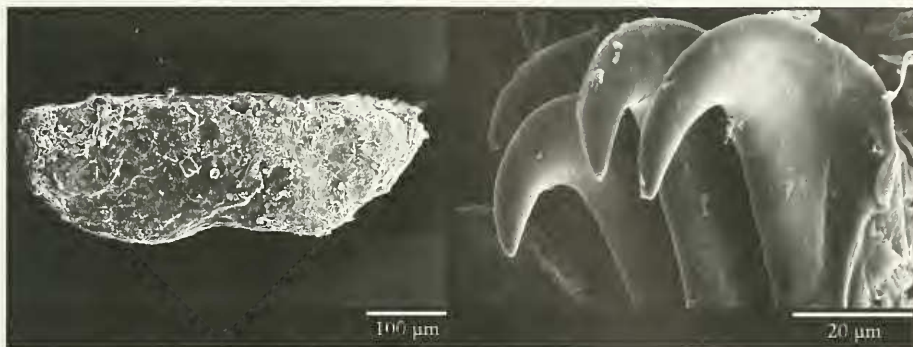


Figure 4. *Aegires absaloi* n. sp. A: Scanning electron micrographs of jaw; B: detail of the radular teeth.

Figura 4. *Aegires absaloi* n. sp. A: Fotos al microscopio electrónico de la mandíbula; B: detalle de los dientes radulares.

Family PLATYDORIDIDAE Bergh, 1891

Genus *Platydoris* Bergh, 1877

Platydoris angustipes (Mörch, 1863) (Fig. 2K)

Material collected: 07/07/1999; station: Porto (Fernando de Noronha Is.); depth: 1 m; 1 specimen; length: 72 mm. 17/06/2000; station: Buraco do Inferno (Rata Is.); depth: 12 m; 1 specimen; length: 20 mm.

Habitat: Under stones associated with sponges and ascidians.

Brazilian distribution: Maranhão, Recife, PE, off Alagoas and Bahia (RIOS, 1994)

Other geographical areas distribution: Caribbean Sea in Florida, Dry Tortugas, Jamaica, Virgin Islands (MARCUS AND MARCUS, 1967).

Family DENDRODORIDIDAE O'Donoghue, 1924

Genus *Dendrodoris* Ehrenberg, 1831

Dendrodoris senegalensis Bouchet, 1975 (Fig. 2L)

Material collected: 07/07/1999; station: Porto (Fernando de Noronha Is.); depth: intertidal; 1 specimen; length: 21 mm. 19/06/2000; station: Buraco do Inferno (Rata Is.); depth: 14 m; 2 specimens; length: 9, 20 mm.

Habitat: Under stones associated with sponges and ascidians.

Brazilian distribution: Present paper.

Other geographical areas distribution: Only known from Cabo Verde Is. and Senegal.

Remarks: The dorsal surface and notal margin are uniform red or red brown with irregular areas; the rinophores are red with the tip white; the gills

and anal papilla are both uniform white; ventrally the notal margin and foot are white with small red spots.

Internally, our specimens coincide with the descriptions of *D. senegalensis* by BOUCHET (1975) and VALDÉS, ORTEA, ÁVILA AND BALLESTEROS (1996). A complete description and distribution remarks of this species are provide in GARCÍA AND TRONCOSO (in press).

Suborder AEOLIDIINA Odhner, 1934
Family FACELINIDAE Bergh in Carus, 1889
Genus *Phidiana* Gray, 1850

Phidiana sp. (Fig. 2M)

Material collected: 17/06/2000; station: Ressurreta (Rata Is.); depth: 14 m; 3 specimens; length: 11 to 17 mm. 18/06/2000; station: Ressurreta (Rata Is.); depth: 12 m; 2 specimens; length: 16-18 mm.

Habitat: On and under stones associated with hydrozoans.

Remarks: The ground colour is reddish with numerous white spots on the dorsal and lateral surfaces of the body; the basal third of the oral tentacles is reddish with white spots, the middle third is orange

and the apical third is hyaline white; the foot is reddish; the rhinophores are orange with white tip; the apical surface of cerata are orange, the subapical area are white and the basal part are translucent. A complete description of this species is provided in GARCÍA AND TRONCOSO (in press).

CONCLUSIONS

We found a total of 111 specimens of opisthobranchs belonging to 12 species, 1 Cephalaspidea, 1 Anaspidea, 3 Ascoglossa, 2 Notaspidea, 4 Doridacea and 1 Aeolidacea. In Table I the species of Opisthobranchia found up to date in the Archipelago Fernando de Noronha are listed.

Among them, only four species were recorded by MATTHEWS AND KEMPF (1970): *Micromelo undata* (Bruguière, 1792), *Hydatina vesicaria* (Solander, 1786), *Retusa canaliculata* (Say, 1827) and *Cylichna noronhensis* Watson, 1883. RIOS AND BARCELLOS (1979) mentioned the occurrence of *Atya mandrewii* and *Berthelinia caribbea*.

The occurrence of *Elysia ornata*, and *E. flava* are the first records for Brazil.

The Archipelago de Fernando de Noronha does not appear to be as rich in

species of opisthobranchs as expected in tropical areas. A big effort is necessary to find species, they are mainly herbivorous and are associated to seaweeds (*Micromelo undata*, *Stylocheilus longicauda*, *Elysia ornata*, *E. flava*, *Caliphyllo mediterranea*).

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BIBLIOGRAPHY

- BERTSCH, H. AND SMITH, A. A., 1973. Observations on three opisthobranchs (Mollusca: Gastropoda) of the La Paz area, Baja California, Mexico. *Southwestern Naturalist*, 18 (2): 165-176.
- BOUCHET, PH., 1975. Nudibranches nouveaux des côtes du Senegal. *Vie Milieu*, 25 (1 A): 119-132.
- CERVERA, J. L., TEMPLADO, J., GARCÍA-GÓMEZ, J. C., BALLESTEROS, M., ORTEA, J. A., GARCÍA, F. J., ROS, J. AND LUQUE, A. A., 1988. Catálogo actualizado y comentado de los Opisthobranchios (Mollusca, Gastropoda) de la Península Ibérica, Baleares y Canarias, con algunas referencias a Ceuta y la isla de Alborán. *Iberus*, Suppl. 1: 1-84.

- CLARK, K. B., 1984. New records and synonymies of Bermuda Opisthobranchs (Gastropoda). *The Nautilus*, 98 (2): 85-97.
- EDMUNDS, M., 1968. Opisthobranchiate molluscan from Ghana. *Proceedings of the Malacological Society of London*, 38: 83-100.
- FARMER, W., 1967. Notes on the opisthobranchia of Baja California, Mexico, with range extensions.-II. *The Veliger*, 9 (3): 340-342.
- GARCÍA, F. J. AND TRONCOSO, J. S., in press. Two unknown species of Mollusca Gastropoda from the Archipelago Fernando de Noronha (Brazil), with description of a new species belonging to the genus *Phidiana* Gray, 1850 and new record of *Dendrodoris senegalensis* Bouchet, 1975. *Scientia Marina*.
- GASCOIGNE, T., 1979. A redescription of *Caliphylla mediterranea* Costa, 1867 (Opisthobranchia: Ascoglossa). *Journal of Molluscan Studies*, 45: 300-311.
- GOSLINER, T., 1987. *Nudibranchs of Southern Africa. A guide to Opisthobranch Molluscs of Southern Africa*. Sea Challengers, Monterey, California, 136 pp.
- GOSLINER, T. M. AND BERTSCH, H., 1988. A review of the genus *Berthella* (Opisthobranchia: Notaspidea) from the Pacific Coast of North America. *The Veliger*, 31 (1-2): 46-67.
- JENSEN, K. R. AND CLARK, K. B. 1983. Annotated checklist of Florida ascoglossan Opisthobranchia. *The Nautilus*, 97: 1-13.
- LOPES, H. S. AND ALVARENGA, M. 1957. Contribuição ao conhecimento dos moluscos da Ilha Fernando de Noronha - Brasil. *Boletim do Instituto Oceanográfico, Universidade de São Paulo*, vol. VI, fasc. 1 e 2: 157-190.
- MACFARLAND, F. M., 1966. *Studies of Opisthobranchiate Mollusks of the Pacific coast of North America*. Memoirs of the California Academy of Sciences, vol. 6, 546 pp.
- MALAQUIAS, M. A., 2001. Updated and annotated checklist of the opisthobranch molluscs (excluding Thecosomata and Gymnosomata) from the Azores Archipelago (North Atlantic Ocean, Portugal). *Iberus*, 19 (1): 37-48.
- MALAQUIAS, M. A.; CERVERA, J. L.; ABREU, A. D. AND LÓPEZ-GONZÁLEZ, P. J., 2001. The Opisthobranch Molluscs from Porto Santo Island (Madeira Archipelago, Northeast Atlantic). *Iberus*, 19 (1): 75-82.
- MARCUS, E., 1955. Opisthobranchia from Brazil. *Boletins da Faculdade de Filosofia, Ciências e Letras, Universidade de São Paulo, Zoologia*, 20: 89-262.
- MARCUS, E., 1957. On opisthobranchia from Brazil (2). *Journal of the Linnean Society, London*, 43 (292): 390-486.
- MARCUS, E. AND MARCUS, EV., 1970. Opisthobranchs from Curaçao and faunistically related regions. *Studies on the Fauna of Curaçao and others Caribbean Islands*, 33: 1-129.
- MARCUS, EV., 1977. An annotated check list of the Western Atlantic warm water opisthobranchs. *Journal of Molluscan Studies*, Suppl 4: 1-22.
- MARCUS, EV., 1980. Review of Western Atlantic Elysiidae (Opisthobranchia Ascoglossa) with a description of a new *Elysia* species. *Bulletin of Marine Science*, 30 (1): 54-79.
- MARCUS, EV. AND MARCUS, E., 1967. American Opisthobranch Mollusks. *Studies in Tropical Oceanography*. Miami, 6, 256 pp.
- MARSHALL, J. G. AND WILLAN, R. C., 1999. *Nudibranchs of Heron Island, Great Barrier Reef. A survey of the Opisthobranchia (Sea Slugs) of Heron and Wistari Reefs*. Backhuys Publishers Leiden, 257 pp.
- MATTHEWS, H. R. AND KEMPF, M., 1970. Moluscos marinhos do Norte e Nordeste do Brasil. II - Moluscos do Arquipélago de Fernando de Noronha (com algumas referências ao Atol das Rocas). *Arquivos de Ciências do Mar*, 10 (1): 1-53.
- MIKKELSEN, P. M., 1995. Cephalaspid opisthobranchs of the Azores. *Açoreana*, Supplement: 193-215.
- ORTEA, J. A., 1981. Moluscos Opistobranquios de las Islas Canarias. *Boletín del Instituto Español de Oceanografía*, 6 (4): 180-199.
- ORTEA, J. A.; LUQUE, A. A. AND TEMPLADO, J., 1990. Contribution to the knowledge of the genus *Aegires* Lóven, 1844 (Opisthobranchia: Doridoidea: Aegiretidae) in the North Atlantic, with descriptions of two new species. *Journal of Molluscan Studies*, 56: 333-337.
- ORTEA, J. A.; MORO, L.; BACALLADO, J. J. AND HERRERA, R., 2000. Catálogo actualizado de los Moluscos Opistobranquios de las Islas Canarias. *Revista de la Academia Canaria de Ciencias*, XII (3-4): 105-134.
- PRUVOT-FOL, A., 1954. *Mollusques Opisthobranches*. In: *Faune de France*, Paul Lechevalier, Paris, 58: 1-460.
- RIOS, E. C., AND BARCELLOS, L. P., 1979. Nuevas ocurrencias de moluscos marinos para el Archipiélago de Fernando de Noronha, Brasil. *Comunicaciones de la Sociedad Malacológica del Uruguay*, vol. V, nº 37: 163-166.
- RIOS, E. C., 1994. *Seashells of Brazil. 2nd Edition*. Editora da FURG, Rio Grande, RS, Brazil. 368 pp, 113 pl.
- SCHMEKEL, L. AND PORTMANN, A., 1982. *Opisthobranchia des Mittelmeeres*, Springer Verlag, Berlin. 410 pp.
- TEMPLADO, J.; LUQUE, A. A. AND ORTEA, J., 1987. A new species of *Aegires* Lóven, 1844 (Opisthobranchia: Doridacea: Aegiretidae) from the Caribbean Sea: *Aegires ortizi* spec. nov., with comparative descriptions of the North Atlantic species of this genus. *The Veliger*, 29 (3): 303-307.

- THOMPSON, T. E., 1977. Jamaican Opisthobranch Molluscs I. *Journal of Molluscan Studies*, 43: 93-140.
- THOMPSON, T. E., 1983. The Bermudan and Caribbean Sacoglossan Mollusk *Elysia flava* Verrill now recorded from the Greek Aegean Sea. *The Veliger*, 26 (2): 136-138.
- THOMPSON, T. E. AND JAKLIN, A., 1988. Eastern Mediterranean Opisthobranchia: Elysiidae (Sacoglossa = Ascoglossa). *Journal of Molluscan Studies*, 54: 59-69.
- VALDÉS, A., ORTEA, J., ÁVILA, C. AND BALLESTEROS, M., 1996. Review of the genus *Dendrodoris* Ehrenberg, 1831 (Gastropoda: Nudibranchia) in the Atlantic Ocean. *Journal of Molluscan Studies*, 62: 1-31.